



DVD-R Drive for General & for DL

TEST SPECIFICATION

Version 2.8
January 2008

Amendment for DVD-R Drive for General & for DL TS Version 2.8 (Jan. 2008)

The following pages were amended without changing the version number of the TS.

- **Minor amendment (March 26, 2009)**

Page	Location	Amendment
Page 41	Annex A	<ul style="list-style-type: none">• Class-A Lab information of "Industrial Technology Research Institute" and "Matsushita Electric Industrial Co., Ltd. (company name)" was updated.

- **Minor amendment (January 2010)**

Page	Location	Amendment
Page 41	Annex A	<ul style="list-style-type: none">• Class-A Lab information of "Hitachi, Ltd. (company name)", "Panasonic Corporation" and "PIONEER CORPORATION" were updated.
Page 44	Annex D	<ul style="list-style-type: none">• Class-A Lab information of "PIONEER CORPORATION" was updated.

- **Amendment 1 (January 2012)**

Page	Location	Amendment
Page 41	Annex A	<ul style="list-style-type: none">• "Toshiba Corporation" was deleted from the Class-A Lab list.

- **Amendment 2 (June 2012)**

Page	Location	Amendment
Page 41	Annex A	<ul style="list-style-type: none">• "Industrial Technology Research Institute" was deleted from the Class-A Lab list.• Class-A Lab information of "Sony Corporation" was updated.

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Revision History

- May 2000
DVD-R Drive for General Test Specification version 2.0 (Draft) was approved by Verification Task Force members.
- June 2000
DVD-R Drive for General Test Specification version 2.0 was authorized by Steering Committee members.
- April 17, 2002
Version-up 2.1 to add the test procedure and items for 8 cm drive was approved by VTF members.
- August 22, 2002
Version-up 2.2 to add the test procedure and items for 4x-speed DVD-R Drive for General was approved by VPC.
- December 17, 2003
Version-up to 2.3, to add the test procedure and items for 12cm/8x-speed DVD-R Drive, was approved by VPC.
- November 22, 2004
Version-up to 2.4, to add the test procedure and items for 12cm/6x/1x-speed DVD-R Drive, 12cm/12x/1x-speed DVD-R Drive and 12cm/16x/1x-speed DVD-R Drive was approved by VTF.
- March 16, 2005
DVD-R Disc for General & for DL Test Specification Version 2.5 was approved by VTF.
The version 2.5 added Test Specification for DVD-R Drive for DL based on DVD-R for DL Book Part 1: Ver. 3.0.
- February 21, 2006
Version-up to 2.6, to add the test procedure and items for 12cm/6x/2x-speed DVD-R for DL Drive and 12cm/8x/2x-speed DVD-R for DL Drive, was approved by VTF.
After that, some editorial modifications were done.
(The Version 2.6 was issued in April 2006.)
- July 4, 2006
Version-up to 2.7, to add the test procedure and items for 8cm/4x/2x-speed DVD-R for DL Drive and 8cm/2x-speed DVD-R for DL Drive, was approved by VTF.
- January 11, 2008
Version-up to 2.8, to add the test procedure and items for 12cm/10x/2x-speed DVD-R for DL Drive and 12cm/12x/2x-speed DVD-R for DL Drive, was approved by TSTF.

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Forms for DVD Format verification

Form 1T

Preliminary Information for DVD Format Verification F1

Form 2T

Test Information of DVD Format Verification F2

Form 3T

Test results of Recording characteristics for 12cm/1x-speed SL Type 1 F4

Form 4T

Test result of 1x-speed Linking characteristic for 12cm SL F6

Form 5T

Test results of Information data in Lead-in and RMA for 12cm/1x-speed SL F7

Form 6T

Test result of Reading characteristics for 12cm SL F9

Form 7T

Test results of Recording characteristics for 8cm/1x-speed SL Type 1 F10

Form 8T

Test result of 1x-speed Linking characteristic for 8cm SL F12

Form 9T

Test results of Information data in Lead-in and RMA for 8cm/1x-speed SL F13

Form 10T

Test result of Reading characteristics for 8cm SL F15

Form 11T

Test results of Recording characteristics for 12cm/4x-speed SL F16

Form 12T

Test result of 4x-speed Linking characteristic for 12cm SL F18

Form 13T

Test results of Information data in Lead-in and RMA for 12cm/4x-speed SL F19

Form 14T

Test results of Recording characteristics for 12cm/6x-speed SL F21

Form 15T

Test result of 6x-speed Linking characteristic for 12cm SL F23

Form 16T

Test results of Information data in Lead-in and RMA for 12cm/6x-speed SL F24

Form 17T

Test results of Recording characteristics for 12cm/8x-speed SL F26

Form 18T

Test result of 8x-speed Linking characteristic for 12cm SL F28

Form 19T

Test results of Information data in Lead-in and RMA for 12cm/8x-speed SL F29

Form 20T

Test results of Recording characteristics for 12cm/12x-speed SL F31

Form 21T

Test result of 12x-speed Linking characteristic for 12cm SL F33

Form 22T

Test results of Information data in Lead-in and RMA for 12cm/12x-speed SL F34

Form 23T

Test results of Recording characteristics for 12cm/16x-speed SL F36

Form 24T

Test result of 16x-speed Linking characteristic for 12cm SL F37

Form 25T

Test results of Information data in Lead-in and RMA for 12cm/16x-speed SL F38

Form 26T

Test results of Recording characteristics for 12cm/2x-speed DL F40

Form 27T

Test result of 2x-speed Linking characteristic for 12cm DL F44

Form 28T

Test results of Information data in Lead-in and RMA for 12cm/2x-speed DL F45

Form 29T

Test result of Reading characteristics for 12cm DL F47

Form 30T

Test results of Recording characteristics for 12cm/4x-speed DL F48

Form 31T

Test result of 4x-speed Linking characteristic for 12cm DL F52

Form 32T

Test results of Information data in Lead-in and RMA for 12cm/4x-speed DL F53

Form 33T

Test results of Recording characteristics for 12cm/6x-speed DL F55

Form 34T

Test result of 6x-speed Linking characteristic for 12cm DL F59

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Form 38T

Test results of Information data in Lead-in and RMA for 12cm/8x-speed DL F67

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Form 40T

Test result of 10x-speed Linking characteristic for 12cm DL F73

Form 41T

Test results of Information data in Lead-in and RMA for 12cm/10x-speed DL F74

Form 42T

Test results of Recording characteristics for 12cm/12x-speed DL F76

Form 43T

Test result of 12x-speed Linking characteristic for 12cm DL F78

Form 44T

Test results of Information data in Lead-in and RMA for 12cm/12x-speed DL F79

Form 45T

Test results of Recording characteristics for 8cm/2x-speed DL F81

Form 46T

Test result of 2x-speed Linking characteristic for 8cm DL F85

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Test results of Information data in Lead-in and RMA for 8cm/2x-speed DL F86

Form 48T

Test result of Reading characteristics for 8cm DL F88

Form 49T

Test results of Recording characteristics for 8cm/4x-speed DL F89

Form 50T

Test result of 4x-speed Linking characteristic for 8cm DL F93

Form 51T

Test results of Information data in Lead-in and RMA for 8cm/4x-speed DL F94

Form 52T

Confirmation of DVD Format Verification F96

1. General

1.1 Scope

The scope of this Test Specification is the testing "DVD-R Drive for General" and "DVD-R Drive for DL" for compliance with DVD Specifications mentioned in **1.2**. Test Specifications for 7 types of "DVD-R Drive for General" and for 8 types of "DVD-R Drive for DL" described in **1.3** are specified in this document. Hereinafter, DVD-R Drive recordable DVD-R Disc for General may be called **DVD-R Drive for General or SL Drive** and DVD-R Drive recordable DVD-R Disc for DL may be called **DVD-R Drive for DL or DL Drive**.

The test procedure described herein could be used by Class-A Verification Labs, Class-B Verification Labs and Quality Assurance Departments of "DVD-R Drive for General and for DL" manufacturers.

The scope of this Test Specification is limited to product's compliance to DVD Specifications and not to evaluate performance of products.

1.2 Normative References

a) DVD Specifications for Recordable Disc for General (DVD-R for General)

- Part 1: Physical Specifications Version 2.1
- Optional Specifications 4x-speed DVD-R Revision 1.0
- Optional Specifications 6x-speed DVD-R Revision 2.0
- Optional Specifications 8x-speed DVD-R Revision 3.0
- Optional Specifications 2x-speed DVD-R Revision 4.0
- Optional Specifications 12x-speed DVD-R Revision 5.0
- Optional Specifications 16x-speed DVD-R Revision 6.0

b) DVD Specifications for Recordable Disc for Dual Layer (DVD-R for DL)

- Part 1: Physical Specifications Version 3.0
- Optional Specifications 4x-speed DVD-R for DL Revision 1.0
- Optional Specifications 6x-speed DVD-R for DL Revision 2.0
- Optional Specifications 8x-speed DVD-R for DL Revision 3.0
- Optional Specifications 10x-speed DVD-R for DL Revision 4.0
- Optional Specifications 12x-speed DVD-R for DL Revision 5.0

1.3 Scope of Products Covered

a) DVD-R Drive for General (SL Drive)

12cm type	8cm type
1x-speed DVD-R Drive for General (Class 0)	1x-speed DVD-R Drive for General (Class 0)
4x/1x-speed DVD-R Drive for General (Class 0)	
6x/1x-speed DVD-R Drive for General (Class 0)	
8x/1x-speed DVD-R Drive for General (Class 0)	
12x/1x-speed DVD-R Drive for General (Class 0)	
16x/1x-speed DVD-R Drive for General (Class 0)	

b) DVD-R Drive for DL (DL Drive)

12cm type	8cm type
2x-speed DVD-R Drive for DL (Class 0)	2x-speed DVD-R Drive for DL (Class 0) 4x/2x-speed DVD-R Drive for DL (Class 0)
4x/2x-speed DVD-R Drive for DL (Class 0)	
6x/2x-speed DVD-R Drive for DL (Class 0)	
8x/2x-speed DVD-R Drive for DL (Class 0)	
10x/2x-speed DVD-R Drive for DL (Class 0)	
12x/2x-speed DVD-R Drive for DL (Class 0)	

Note: The recording speeds (Ax/Bx) specify the Maximum recording speed (Ax) and the Basic recording speed (Bx) that the Drive supports. The Drive can also support other recording speed between the Maximum and Basic speed.

2. DVD Logo

DVD Format/Logo Licensing Corporation owns the rights to license the DVD Logo. To be able to use the DVD Logo, DVD manufacturer must have:

- a. License to use the Logo and
- b. DVD Specification compliance of the product for logo consideration must be validated by the test specifications as defined in this document.

Licensing terms for the DVD Logo are available from the DVD Format/Logo Licensing Corporation.

This chapter describes the mechanism to be used for product compliance testing.

2.1 Definition of Terms Used

First Production Model - The **First Production Model** must be tested and approved by any of the appropriate Class-A Verification Labs (see definition of Class-A Labs below) for compliance with DVD Specifications. Class-A Labs will use the test specifications described in this document for compliance verification.

The following parameters must be used to determine a **First Production Model** for each of "DVD-R Drive for General" (SL Drive) and "DVD-R Drive for DL" (DL Drive) independently:

- DVD Specifications Version n.x changing to $n \pm 1.x$.
- Initial or the latest production model at the start of Logo Program for each licensee.
- Production model that supports additional Class.

Examples of First Production Model

SL Drive: 1x-speed DVD-R Drive for General (Class 0)

- or 4x/1x-speed DVD-R Drive for General (Class 0)
- or 6x/1x-speed DVD-R Drive for General (Class 0)
- or 8x/1x-speed DVD-R Drive for General (Class 0)
- or 12x/1x-speed DVD-R Drive for General (Class 0)
- or 16x/1x-speed DVD-R Drive for General (Class 0)
- or 8cm type 1x-speed DVD-R Drive for General (Class 0)

DL Drive: 2x-speed DVD-R Drive for DL (Class 0)

- or 4x/2x-speed DVD-R Drive for DL (Class 0)
- or 6x/2x-speed DVD-R Drive for DL (Class 0)
- or 8x/2x-speed DVD-R Drive for DL (Class 0)
- or 10x/2x-speed DVD-R Drive for DL (Class 0)
- or 12x/2x-speed DVD-R Drive for DL (Class 0)
- or 8cm type 2x-speed DVD-R Drive for DL (Class 0)
- or 8cm type 4x/2x-speed DVD-R Drive for DL (Class 0)

Next Production Model - A **Next Production Model** does not require compliance verification from a Class-A Verification Lab but must be tested by licensee in its QA department for compliance with DVD Specifications. Licensee's QA department must have the test tools required to perform the tests specified in this document and must, at minimum, use the test procedure referred to in this document (licensee is free to have its own QA procedure, equipment and tools as long as it is a superset of the specification described in this document). A Licensee without own QA department can get the product tested by a certified Third Party Class-B Verification Lab (see definition of Class-B Labs below).

The following parameters must be used to determine a **Next Production Model**:

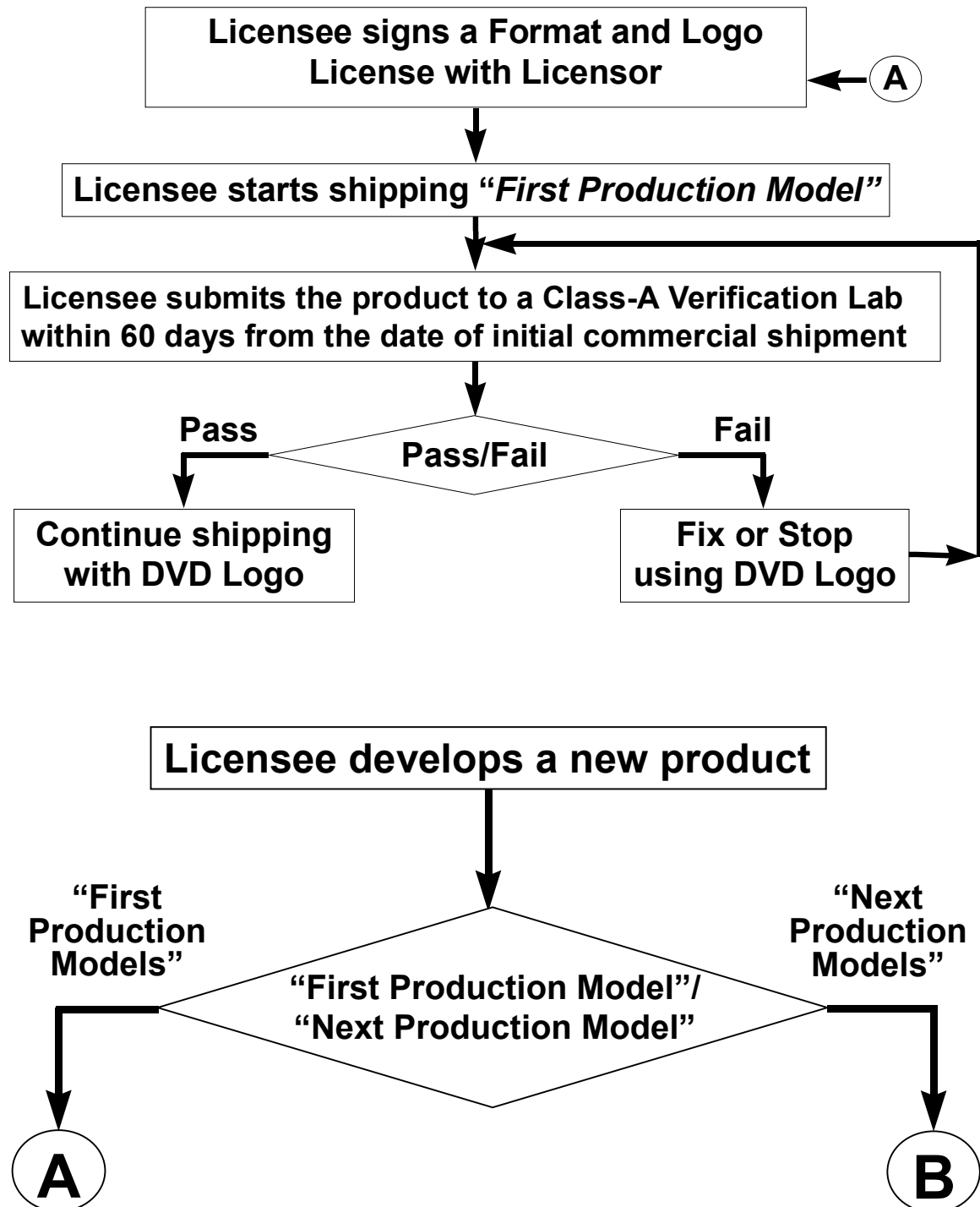
- DVD Specifications Version n.x changing to n.x+1.
- Change to add or reduce supporting disc size (8cm or 12cm)
- Change to add or reduce applicable recording speed(s) without adding Class (i.e. Basic recording speed).
- Significant changes at Licensees discretion to Pickup head, LSI and/or firmware related to DVD format.

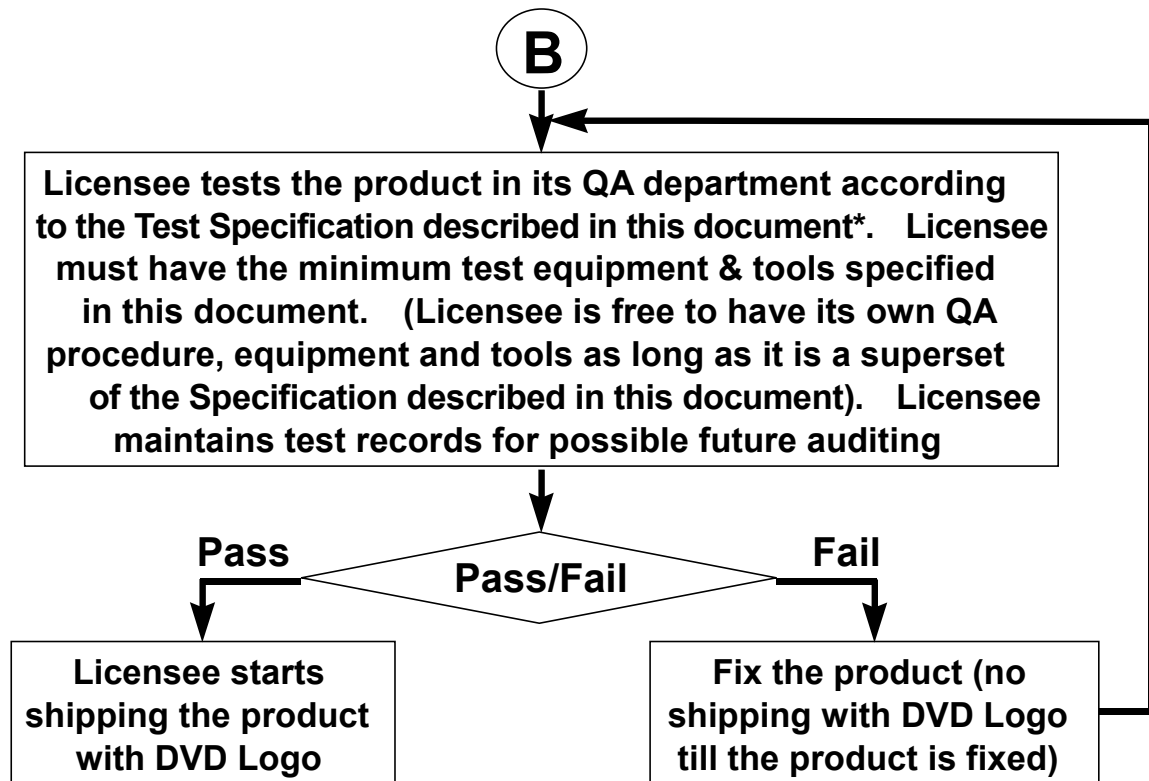
Class-A Verification Labs - Class-A Verification Labs are experts in DVD technology and provide independent expert assessment of Licensee's product compliance with respect to DVD Specifications. Class-A Labs also provide additional services such as interpretation of DVD Specifications, Test Tool development, Class-B Labs and Licensees auditing, etc.

Class-B Verification Labs - DVD-R Drive for General & for DL Class-B Verification Labs provide DVD-R Drive testing strictly according to **DVD-R Drive for General & for DL Test Specification** (They can not interpret specifications).

2.2 DVD Logo Mechanism

The DVD Logo mechanism is described in the following flow chart:





*: Licensee without own QA department can get the product tested by a **DVD-R Drive for General & for DL Class-B Verification Lab**.

3. General procedure of Test

The following sections describe the requirements and test specifications for DVD-R Drive products described in **1.3 Scope of Products Covered**.

The discs recorded with DVD-R Drive have to be in compliance with the physical DVD requirements as indicated in DVD Specifications mentioned in **1.2**.

This shall be confirmed by parameters as mentioned in **Form 3T to Form 51T**.

3.1 Test procedure for SL Drive

- Test shall be carried out according to the nomination of maximum recording speed applied in **Form 2T** (1/2).

Test procedure of each recording speed is described in the following chapters from **4** to **10** respectively.

Table 3.1-1 and **Table 3.1-2** show the relation between "Product type" and "Chapter number" to be carried out.

When "Required" is marked in the column of a chapter, the test described in the chapter shall be carried out.

For example, in case of Model D, Test described in chapter **4**, **6** and **8** shall be carried out.

Table 3.1-1 : "Product type" and "Chapter number" to be carried out (12cm SL Drive)

Product type		Chapter					
		4.	6.	7.	8.	9.	10.
1st Production Model		1x recording	4x recording	6x recording	8x recording	12x recording	16x recording
A	1x-speed SL Drive	Required	----	----	----	----	----
B	4x/1x-speed SL Drive	Required	Required	----	----	----	----
C	6x/1x-speed SL Drive	Required	Required	Required	----	----	----
D	8x/1x-speed SL Drive	Required	Required	----	Required	----	
E	12x/1x-speed SL Drive	Required	Required	----	Required	Required	
F	16x/1x-speed SL Drive	Required	Required	----	Required	----	Required

Table 3.1-2 : "Product type" and "Chapter number" to be carried out (8cm SL Drive)

Product type		Chapter
		5.
1st Production Model		1x recording
A	1x-speed SL Drive	Required

- An applicant is requested to submit the test samples with the test results, which may be obtained by self-verification or verification conducted by Class-B Lab.
- For the confirmation of required test items, "Check list of Forms for Submission" is prepared in **Form 2T** (2/2). Write the check mark in each column according to your situation.

- In the case of 12cm Drive, relation between "Product type" and "Check speed" at each measuring point in radius (R) are decided as shown in **Table 3.1-3**.

Table 3.1-3 : "Product" and "Check speed" to be carried out (12cm SL Drive)

Product type		Measuring points in radius	Test Disc to be used					
			1x-speed GRBTD-001	4x/1x-speed GRBTD-021	8x/1x-speed GRBTD-031		16x/1x-speed GRBTD-041	
A	1x-speed SL Drive	25 mm	1x	-----	-----	-----	-----	-----
		40 mm	1x	-----	-----	-----	-----	-----
		55 mm	1x	-----	-----	-----	-----	-----
B	4x/1x-speed SL Drive	25 mm	1x	*	-----	-----	-----	-----
		40 mm	1x	*	-----	-----	-----	-----
		55 mm	1x	4x	-----	-----	-----	-----
C	6x/1x-speed SL Drive	25 mm	1x	*	*	-----	-----	-----
		40 mm	1x	*	*	-----	-----	-----
		55 mm	1x	4x	6x	-----	-----	-----
D	8x/1x-speed SL Drive	25 mm	1x	*	-----	-----	-----	-----
		40 mm	1x	*	-----	*	-----	-----
		55 mm	1x	4x	-----	8x	-----	-----
E	12x/1x-speed SL Drive	25 mm	1x	*	-----	-----	-----	-----
		40 mm	1x	*	-----	*	*	-----
		55 mm	1x	4x	-----	8x	12x	-----
F	16x/1x-speed SL Drive	25 mm	1x	*	-----	-----	-----	-----
		40 mm	1x	*	-----	*	-----	-----
		55 mm	1x	4x	-----	8x	-----	16x

1x, 2x, 4x,16x : Recording by designated speed

* : Recording by nominated speed (to be specified in **Form 2T** 1/2)

----- : No check

3.2 Test procedure for DL Drive

- Test shall be carried out according to the nomination of maximum recording speed applied in **Form 2T** (1/2).

Test procedure of each recording speed is described in the following chapters from **11** to **18** respectively.

Table 3.2-1 and **Table 3.2-2** show the relation between "Product Type" and "Chapter number" to be carried out.

When "Required" is marked in the column of a chapter, the test described in the chapter shall be carried out.

For example, in case of Model H, Test described in chapter **11** and **12** shall be carried out.

Table 3.2-1 : "Product type" and "Chapter number" to be carried out (12cm DL Drive)

Product type		Chapter					
1st Production Model		11.	12.	13.	14.	15.	16.
		2x recording	4x recording	6x recording	8x recording	10x recording	12x recording
G	2x-speed DL Drive	Required	----	----	----	----	----
H	4x/2x-speed DL Drive	Required	Required	----	----	----	----
I	6x/2x-speed DL Drive	Required	Required*	Required	----	----	----
J	8x/2x-speed DL Drive	Required	Required*	Required*	Required	----	----
K	10x/2x-speed DL Drive	Required	Required*	Required*	Required*	Required	----
L	12x/2x-speed DL Drive	Required	Required*	Required*	Required*	Required*	Required

*: Test at the intermediate speed(s) are required, however, the actual recording speeds are at applicant's discretion.

Applicant is required to confirm recording speed referring to **Table 3.2-3**.

Table 3.2-2 : "Product type" and "Chapter number" to be carried out (8cm DL Drive)

Product type		Chapter	
1st Production Model		17.	18.
		2x recording	4x recording
B	2x-speed DL Drive	Required	----
C	4x/2x-speed DL Drive	Required	Required

- An applicant is requested to submit the test samples with the test results, which may be obtained by self-verification or verification conducted by Class-B Lab.
- For the confirmation of required test items, "Check list of Forms for Submission" is prepared in **Form 2T** (2/2). Write the check mark in each column according to your situation.
- Relation between "Product type" and "Check speed" at each measuring point in radius (R) are decided as shown in **Table 3.2-3** and **Table 3.2-4**.

Table 3.2-3 : "Product type" and "Check speed" to be carried out (12cm DL Drive)

Product type		Measuring points in radius	Test Disc to be used											
			4x/2x-speed GRBTD-001-DL		4x/2x-speed GRBTD-001-DL		8x/2x-speed GRBTD-011-DL		8x/2x-speed GRBTD-011-DL		12x/2x-speed DHRR85TT1SP		12x/2x-speed DHRR85TT1SP	
			L0	L1	L0	L1	L0	L1	L0	L1	L0	L1	L0	L1
G	2x-speed DL Drive	25 mm	2x	2x	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
		40 mm	2x	2x	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
		55 mm	2x	2x	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
H	4x/2x-speed DL Drive	25 mm	2x	2x	*	*	-----	-----	-----	-----	-----	-----	-----	-----
		40 mm	2x	2x A	* A	*	-----	-----	-----	-----	-----	-----	-----	-----
		55 mm	2x	2x A	4x A	4x	-----	-----	-----	-----	-----	-----	-----	-----
I	6x/2x-speed DL Drive	25 mm	2x	2x	*	*	*	*	-----	-----	-----	-----	-----	-----
		40 mm	2x	2x A	* A	* A	* A	*	-----	-----	-----	-----	-----	-----
		55 mm	2x	2x A	* A	* A	6x A	6x	-----	-----	-----	-----	-----	-----
J	8x/2x-speed DL Drive	25 mm	2x	2x	*	*	*	*	-----	-----	-----	-----	-----	-----
		40 mm	2x	2x A	* A	* A	* A	* A	* A	*	-----	-----	-----	-----
		55 mm	2x	2x A	* A	* A	* A	* A	8x A	8x	-----	-----	-----	-----
K	10x/2x-speed DL Drive	25 mm	2x	2x	*	*	*	*	-----	-----	-----	-----	-----	-----
		40 mm	2x	2x A	* A	* A	* A	* A	* A	* A	* A	*	-----	-----
		55 mm	2x	2x A	* A	* A	* A	* A	* A	* A	10x A	10x	-----	-----
L	12x/2x-speed DL Drive	25 mm	2x	2x	*	*	*	*	-----	-----	-----	-----	-----	-----
		40 mm	2x	2x A	* A	* A	* A	* A	* A	* A	* A	* A	-----	-----
		55 mm	2x	2x A	* A	* A	* A	* A	* A	* A	* A	* A	12x A	12x

2x, 4x, 6x, 8x, 10x, 12x : Recording by designated recording speed ----- : No check

* : Recording by nominated speed (to be specified in **Form 2T 1/2**)

A : Applicant submits the data. Lab does not measure but check them.

Table 3.2-4 : "Product type" and "Check speed" to be carried out (8cm DL Drive)

Product type		Measuring points in radius	Test Disc to be used			
			4x/2x-speed GRBTD8-001-DL		4x/2x-speed GRBTD8-001-DL	
			L0	L1	L0	L1
B	2x-speed DL Drive	25 mm	2x	2x	-----	-----
		38 mm	2x	2x	-----	-----
C	4x/2x-speed DL Drive	25 mm	2x	2x	*	*
		38 mm	2x	2x A	4x A	4x

2x, 4x : Recording by designated recording speed ----- : No check

* : Recording by nominated speed (to be specified in **Form 2T 1/2**)

A : Applicant submits the data. Lab does not measure but check them.

4. Test Specifications for 12cm/1x-speed SL Drive

This chapter covers the test specifications and tool requirements for the physical and logical compliance testing the 12cm/1x-speed SL Drive and the 1x-speed recording and reading capability of 12cm/4x/1x-speed SL Drive, 6x/1x-speed SL Drive, 8x/1x-speed SL Drive, 12x/1x-speed SL Drive and 16x/1x-speed SL Drive.

4.1 Test Tools

The following tools are required to perform the tests specified and shall be available before start executing the test procedures.

4.1.1 Test Discs

The following test discs are used for testing 12cm SL Drive. As for acquisition, refer to **Annex D**.

- 12cm/1x-speed DVD-R for General Standard Blank Test Disc
Type 1 GRBTD-001 (Pioneer)
- 12cm DVD-R for General Standard Signal Test Disc
Type 1 GRSTD-101 (Pioneer)

4.1.2 DVD-R measuring system (Playback)

DVD-R measuring system (Playback) shall have functions at least for executing the tests defined in **4.2.1**, **4.2.2** and **4.2.3**. Its reading beam condition shall be as defined 2.1.3.2 of DVD Specifications for Recordable Disc for General Part 1: Ver. 2.1 and its scanning velocity shall be 3.49 m/s (1x-speed).

This system is to be equipped by each Lab and applicant individually.

4.2 Test Specifications

The following sections describe the test procedures required for verification of 12cm SL Drive.

The tests shall be performed according to the items described in **Form 3T to 6T**.

4.2.1 Recording characteristics

This test shall be done for Type 1 of 12cm/1x-speed DVD-R Standard Blank Test Disc.

Write Strategy variations (refer to Annex K of DVD Specifications for Recordable Disc for General Part 1: Ver. 2.1) can be used for recording.

- Random or equivalent signal shall be written in the user area of GRBTD-001 by the Drive.
- Measure the characteristics of the Recorded layer using DVD-R measuring system (Playback) or equivalent and enter the measured values in accordance with **Form 3T**.

4.2.2 1x-speed Linking characteristic

- This test is only for 12cm/1x-speed SL Drive. Other types of product need not execute this test.
- Type 1 12cm/1x-speed DVD-R for General Standard Blank Test Disc is used for this check.
- Random or equivalent signal shall be written in the user area of a 12cm/1x-speed DVD-R for General Standard Blank Test Disc by the Drive. And append the random or equivalent signal in the Incremental recording mode according to the linking scheme that the drive adopts.
- Using DVD-R measuring system (Playback), check whether the time difference between "the peak of LPP" and "center of 14T" is smaller than 7T (260 ns) in any place around Linked area.

If the linking is done properly, mark OK in **Form 4T**.

4.2.3 Information data in Lead-in and RMA

- Type 1 12cm/1x-speed DVD-R for General Standard Blank Test Disc recorded in the test of **4.2.1** shall be used for this check.
- Using DVD-R measuring system (Playback), check the recorded information data in Lead-in and RMA of the recorded DVD-R for General Standard Blank Test Disc. The applicant shall fill out each column of **Form 5T**, and Class-A Lab will check them.

4.2.4 Reading characteristics

- A 12cm DVD-R for General Standard Signal Test Disc (GRSTD-101) shall be read by the Drive. If the entire signal can be read properly, mark OK in **Form 6T**.

5. Test Specifications for 8cm/1x-speed SL Drive

This chapter covers the test specifications and tool requirements for the physical and logical compliance testing the 8cm/1x-speed SL Drive.

5.1 Test Tools

The following tools are required to perform the tests specified and shall be available before start executing the test procedures.

5.1.1 Test Discs

The following test discs are used for testing 8cm/1x-speed SL Drive. As for acquisition, refer to **Annex D**.

- 8cm/1x-speed DVD-R for General Standard Blank Test Disc
Type 1 R-HM110 (Hitachi Maxell)
- 8cm DVD-R for General Standard Signal Test Disc
Type 1 R-HM110-A (Hitachi Maxell)

5.1.2 DVD-R measuring system (Playback)

DVD-R measuring system (Playback) shall have functions at least for executing the tests defined in **5.2.1**, **5.2.2** and **5.2.3**. Its reading beam condition shall be as defined 2.1.3.2 of DVD Specifications for Recordable Disc for General Part 1: Ver. 2.1 and its scanning velocity shall be 3.49 m/s (1x-speed).

This system is to be equipped by each Lab and applicant individually.

5.2 Test Specifications

The following sections describe the test procedures required for verification of 8cm/1x-speed SL Drive. The tests shall be performed according to the items described in **Form 7T to 10T**.

5.2.1 Recording characteristics

This test shall be done for Type 1 of 8cm/1x-speed DVD-R Standard Blank Test Disc.

Write Strategy variations (refer to Annex K of DVD Specifications for Recordable Disc for General Part 1: Ver. 2.1) can be used for recording.

- Random or equivalent signal shall be written in the user area of the 8cm Type 1; R-HM110 by the Drive.
- Measure the characteristics of the Recorded layer using DVD-R measuring system (Playback) or equivalent and enter the measured values in accordance with **Form 7T**.

5.2.2 1x-speed Linking characteristic

- Type 1 8cm/1x-speed DVD-R for General Standard Blank Test Disc is used for this check.
- Random or equivalent signal shall be written in the user area of an 8cm/1x-speed DVD-R for General Standard Blank Test Disc by the Drive. And append the random or equivalent signal in the Incremental recording mode according to the linking scheme that the drive adopts.
- Using DVD-R measuring system (Playback), check whether the time difference between "the peak of LPP" and "center of 14T" is smaller than 7T (260 ns) in any place around Linked area.
If the linking is done properly, mark OK in **Form 8T**.

5.2.3 Information data in Lead-in and RMA

- Type 1 8cm/1x-speed DVD-R for General Standard Blank Test Disc recorded in the test of **5.2.1** shall be used for this check.
- Using DVD-R measuring system (Playback), check the recorded information data in Lead-in and RMA of the recorded DVD-R for General Standard Blank Test Disc. The applicant shall fill out each column of **Form 9T**, and Class-A Lab will check them.

5.2.4 Reading characteristics

- An 8cm DVD-R for General Standard Signal Test Disc (R-HM110-A) shall be read by the Drive. If the entire signal can be read properly, mark OK in **Form 10T**.

6. Test Specifications for 12cm/4x-speed recording capability of SL Drive

This chapter covers the test specifications and tool requirements for the physical and logical compliance testing the 4x-speed recording capability of 12cm/4x/1x-speed SL Drive, 12cm/6x/1x-speed SL Drive, 12cm/8x/1x-speed SL Drive, 12cm/12x/1x-speed SL Drive and 12cm/16x/1x-speed SL Drive. These SL Drives shall cover the 1x-speed Test Specification as well.

Therefore, compliance test of 1x-speed shall be performed according to chapter 4.

6.1 Test Tools

The following tools are required to perform the tests specified and shall be available before start executing the test procedures.

6.1.1 Test Disc

The following test disc is used for testing the 4x-speed recording capability of 12cm SL Drive. As for acquisition, refer to **Annex D**.

- 12cm/4x/1x-speed DVD-R Standard Blank Test Disc: GRBTD-021 (Pioneer)

6.1.2 DVD-R measuring system (Playback)

DVD-R measuring system (Playback) shall have functions at least for executing the tests defined in **6.2.1**, **6.2.2** and **6.2.3**. Its reading beam condition shall be as defined 2.1.3.2 of DVD Specifications for Recordable Disc for General Part 1: Ver. 2.1 and its scanning velocity shall be 3.49 m/s (1x-speed).

This system is to be equipped by each Lab and applicant individually.

6.2 Test Specifications

The following sections describe the test procedures of 4x-speed recording capability required for verification of SL Drive. The tests shall be performed according to the items described in **Form 11T to 13T**.

6.2.1 Recording characteristics

This test shall be done for 12cm/4x/1x-speed DVD-R Standard Blank Test Disc.

Write Strategy variations specified in 2.1.5, Annex B and Annex C of Optional Specifications 4x-speed DVD-R Rev. 1.0 can be used for recording.

- Random or equivalent signal shall be written with 4x-speed in the user area of the 4x/1x-speed DVD-R Standard Blank Test Disc by the Drive.

Recording speed at R=25 and R=40 can be carried out with the declared speed in **Form 2T**.

- Measure the characteristics of the Recorded layer using DVD-R measuring system (Playback) or equivalent and enter the measured values in accordance with **Form 11T**.

6.2.2 4x-speed Linking characteristic

- This test is only for 12cm/4x/1x-speed SL Drive. Other types of product need not execute this test.
- Random or equivalent signal shall be written with 4x-speed in the user area of a 12cm/4x/1x-speed DVD-R for General Standard Blank Test Disc by the Drive. And append the random or equivalent signal in the Incremental recording mode according to the linking scheme that the drive adopts.
- Using DVD-R measuring system (Playback), check whether the time difference between "the peak of LPP" and "center of 14T" is smaller than 7T (260 ns) in any place around Linked area.
If the linking is done properly, mark OK in **Form 12T**.
- This test shall be done in the user area where the Drive can keep performing 4x-speed recording.

6.2.3 Information data in Lead-in and RMA

- The 4x-speed DVD-R for General Standard Blank Test Disc recorded in the test of **6.2.1** shall be used for this check.
- Using DVD-R measuring system (Playback), check the recorded information data in Lead-in and RMA of the recorded Test Disc. The applicant shall fill out each column of **Form 13T**, and Class-A Lab will check them.

7. Test Specifications for 12cm/6x-speed recording capability of SL Drive

This chapter covers the test specifications and tool requirements for the physical and logical compliance testing the 6x-speed recording capability of 12cm/6x/1x-speed SL Drive.

The 6x/1x-speed SL Drive shall cover the 1x-speed and 4x-speed Test Specification as well.

Therefore, compliance test of 1x-speed and 4x-speed shall be performed according to chapter 4 and 6.

7.1 Test Tools

The following tools are required to perform the tests specified and shall be available before start executing the test procedures.

7.1.1 Test Disc

The following test disc is used for testing the 6x-speed recording capability of 12cm/6x/1x-speed SL Drive. As for acquisition, refer to **Annex D**.

- 12cm/8x/1x-speed DVD-R Standard Blank Test Disc: GRBTD-031 (Pioneer)

7.1.2 DVD-R measuring system (Playback)

DVD-R measuring system (Playback) shall have functions at least for executing the tests defined in **7.2.1**, **7.2.2** and **7.2.3**. Its reading beam condition shall be as defined 2.1.3.2 of DVD Specifications for Recordable Disc for General Part 1: Ver. 2.1 and its scanning velocity shall be 3.49 m/s (1x-speed).

This system is to be equipped by each Lab and applicant individually.

7.2 Test Specifications

The following sections describe the test procedures of 6x-speed recording capability required for verification of 12cm/6x/1x-speed SL Drive. The tests shall be performed according to the items described in **Form 14T to 16T**.

7.2.1 Recording characteristics

This test shall be done for 12cm/8x/1x-speed DVD-R Standard Blank Test Disc.

Write Strategy specified in 2.1.5.3 of Optional Specifications 6x-speed DVD-R Rev. 2.0 can be used for recording.

- Random or equivalent signal shall be written with 6x-speed in the user area of the 8x/1x-speed DVD-R Standard Blank Test Disc by the Drive.

Recording speed at R=25 and R=40 can be carried out with the declared speed in **Form 2T**.

- Measure the characteristics of the Recorded layer using DVD-R measuring system (Playback) or equivalent and enter the measured values in accordance with **Form 14T**.

7.2.2 6x-speed Linking characteristic

- Random or equivalent signal shall be written with 6x-speed in the user area of a 12cm/8x/1x-speed DVD-R for General Standard Blank Test Disc by the Drive. And append the random or equivalent signal in the Incremental recording mode according to the linking scheme that the drive adopts.
- Using DVD-R measuring system (Playback), check whether the time difference between "the peak of LPP" and "center of 14T" is smaller than 7T (260 ns) in any place around Linked area.
If the linking is done properly, mark OK in **Form 15T**.
- This test shall be done in the user area where the Drive can keep performing 6x-speed recording.

7.2.3 Information data in Lead-in and RMA

- The 8x/1x-speed DVD-R for General Standard Blank Test Disc recorded in the test of **7.2.1** shall be used for this check.
- Using DVD-R measuring system (Playback), check the recorded information data in Lead-in and RMA of the recorded Test Disc. The applicant shall fill out each column of **Form 16T**, and Class-A Lab will check them.

8. Test Specifications for 12cm/8x-speed recording capability of SL Drive

This chapter covers the test specifications and tool requirements for the physical and logical compliance testing the 8x-speed recording capability of 12cm/8x/1x-speed SL Drive, 12cm/12x/1x-speed SL Drive and 12cm/16x/1x-speed SL Drive. These SL Drives shall cover the 1x-speed and 4x-speed Test Specification as well. Therefore, compliance test of 1x-speed and 4x-speed shall be performed according to chapter 4 and 6.

8.1 Test Tools

The following tools are required to perform the tests specified and shall be available before start executing the test procedures.

8.1.1 Test Disc

The following test disc is used for testing the 8x-speed recording capability of 12cm SL Drive. As for acquisition, refer to **Annex D**.

- 12cm/8x/1x-speed DVD-R Standard Blank Test Disc: GRBTD-031 (Pioneer)

8.1.2 DVD-R measuring system (Playback)

DVD-R measuring system (Playback) shall have functions at least for executing the tests defined in **8.2.1**, **8.2.2** and **8.2.3**. Its reading beam condition shall be as defined 2.1.3.2 of DVD Specifications for Recordable Disc for General Part 1: Ver. 2.1 and its scanning velocity shall be 3.49 m/s (1x-speed).

This system is to be equipped by each Lab and applicant individually.

8.2 Test Specifications

The following sections describe the test procedures of 8x-speed recording capability required for verification of 12cm SL Drive. The tests shall be performed according to the items described in **Form 17T to 19T**.

8.2.1 Recording characteristics

This test shall be done for 12cm/8x/1x-speed DVD-R Standard Blank Test Disc.

Write Strategy specified in 2.1.5.3 of Optional Specifications 8x-speed DVD-R Rev. 3.0 can be used for recording.

- Random or equivalent signal shall be written with 8x-speed in the user area of the 8x/1x-speed DVD-R Standard Blank Test Disc by the Drive.
Recording speed at R=40 can be carried out with the declared speed in **Form 2T**.
- Measure the characteristics of the Recorded layer using DVD-R measuring system (Playback) or equivalent and enter the measured values in accordance with **Form 17T**.

8.2.2 8x-speed Linking characteristic

- This test is only for 12cm/8x/1x-speed SL Drive. Other types of product need not execute this test.
- Random or equivalent signal shall be written with 8x-speed in the user area of a 12cm/8x/1x-speed DVD-R for General Standard Blank Test Disc by the Drive. And append the random or equivalent signal in the Incremental recording mode according to the linking scheme that the drive adopts.
- Using DVD-R measuring system (Playback), check whether the time difference between "the peak of LPP" and "center of 14T" is smaller than 7T (260 ns) in any place around Linked area.
If the linking is done properly, mark OK in **Form 18T**.
- This test shall be done in the user area where the Drive can keep performing 8x-speed recording.

8.2.3 Information data in Lead-in and RMA

- The 8x/1x-speed DVD-R for General Standard Blank Test Disc recorded in the test of **8.2.1** shall be used for this check.
- Using DVD-R measuring system (Playback), check the recorded information data in Lead-in and RMA of the recorded Test Disc. The applicant shall fill out each column of **Form 19T**, and Class-A Lab will check them.

9. Test Specifications for 12cm/12x-speed recording capability of SL Drive

This chapter covers the test specifications and tool requirements for the physical and logical compliance testing the 12x-speed recording capability of 12cm/12x/1x-speed SL Drive.

The 12x/1x-speed SL Drive shall cover the 1x-speed, 4x-speed and 8x-speed Test Specification as well. Therefore, compliance test of 1x-speed, 4x-speed and 8x-speed shall be performed according to chapters **4**, **6** and **8**.

9.1 Test Tools

The following tools are required to perform the tests specified and shall be available before start executing the test procedures.

9.1.1 Test Disc

The following test disc is used for testing the 12x-speed recording capability of 12cm/12x/1x-speed SL Drive. As for acquisition, refer to **Annex D**.

- 12cm/16x/1x-speed DVD-R Standard Blank Test Disc: GRBTD-041 (Pioneer)

9.1.2 DVD-R measuring system (Playback)

DVD-R measuring system (Playback) shall have functions at least for executing the tests defined in **9.2.1**, **9.2.2** and **9.2.3**. Its reading beam condition shall be as defined 2.1.3.2 of DVD Specifications for Recordable Disc for General Part 1: Ver. 2.1 and its scanning velocity shall be 3.49 m/s (1x-speed).

This system is to be equipped by each Lab and applicant individually.

9.2 Test Specifications

The following sections describe the test procedures of 12x-speed recording capability required for verification of 12cm/12x/1x-speed SL Drive. The tests shall be performed according to the items described in **Form 20T to 22T**.

9.2.1 Recording characteristics

This test shall be done for 12cm/16x/1x-speed DVD-R Standard Blank Test Disc.

Write Strategy specified in 2.1.5.3 of Optional Specifications 12x-speed DVD-R Rev. 4.0 can be used for recording.

- Random or equivalent signal shall be written with 12x-speed in the user area of the 16x/1x-speed DVD-R Standard Blank Test Disc by the Drive.

Recording speed at R=40 can be carried out with the declared speed in **Form 2T**.

- Measure the characteristics of the Recorded layer using DVD-R measuring system (Playback) or equivalent and enter the measured values in accordance with **Form 20T**.

9.2.2 12x-speed Linking characteristic

- Random or equivalent signal shall be written with 12x-speed in the user area of a 12cm/16x-speed DVD-R for General Standard Blank Test Disc by the Drive. And append the random or equivalent signal in the Incremental recording mode according to the linking scheme that the drive adopts.
- Using DVD-R measuring system (Playback), check whether the time difference between "the peak of LPP" and "center of 14T" is smaller than 7T (260 ns) in any place around Linked area.
If the linking is done properly, mark OK in **Form 21T**.
- This test shall be done in the user area where the Drive can keep performing 12x-speed recording.

9.2.3 Information data in Lead-in and RMA

- The 16x/1x-speed DVD-R for General Standard Blank Test Disc recorded in the test of **9.2.1** shall be used for this check.
- Using DVD-R measuring system (Playback), check the recorded information data in Lead-in and RMA of the recorded Test Disc. The applicant shall fill out each column of **Form 22T**, and Class-A Lab will check them.

10. Test Specifications for 12cm/16x-speed recording capability of SL Drive

This chapter covers the test specifications and tool requirements for the physical and logical compliance testing the 16x-speed recording capability of 12cm/16x/1x-speed SL Drive.

The 16x/1x-speed SL Drive shall cover the 1x-speed, 4x-speed and 8x-speed Test Specification as well. Therefore, compliance test of 1x-speed, 4x-speed and 8x-speed shall be performed according to chapters **4**, **6** and **8**.

10.1 Test Tools

The following tools are required to perform the tests specified and shall be available before start executing the test procedures.

10.1.1 Test Disc

The following test disc is used for testing the 16x-speed recording capability of 12cm/16x/1x-speed SL Drive. As for acquisition, refer to **Annex D**.

- 12cm/16x/1x-speed DVD-R Standard Blank Test Disc: GRBTD-041 (Pioneer)

10.1.2 DVD-R measuring system (Playback)

DVD-R measuring system (Playback) shall have functions at least for executing the tests defined in **10.2.1**, **10.2.2** and **10.2.3**. Its reading beam condition shall be as defined 2.1.3.2 of DVD Specifications for Recordable Disc for General Part 1: Ver. 2.1 and its scanning velocity shall be 3.49 m/s (1x-speed).

This system is to be equipped by each Lab and applicant individually.

10.2 Test Specifications

The following sections describe the test procedures of 16x-speed recording capability required for verification of 12cm/16x/1x-speed SL Drive. The tests shall be performed according to the items described in **Form 23T to 25T**.

10.2.1 Recording characteristics

This test shall be done for 12cm/16x/1x-speed DVD-R Standard Blank Test Disc.

Write Strategy specified in 2.1.5.3 of Optional Specifications 16x-speed DVD-R Rev. 5.0 can be used for recording.

- Random or equivalent signal shall be written with 16x-speed in the user area of the 16x/1x-speed DVD-R Standard Blank Test Disc by the Drive.
- Measure the characteristics of the Recorded layer using DVD-R measuring system (Playback) or equivalent and enter the measured values in accordance with **Form 23T**.

10.2.2 16x-speed Linking characteristic

- Random or equivalent signal shall be written with 16x-speed in the user area of a 12cm/16x/1x-speed DVD-R for General Standard Blank Test Disc by the Drive. And append the random or equivalent signal in the Incremental recording mode according to the linking scheme that the drive adopts.
- Using DVD-R measuring system (Playback), check whether the time difference between "the peak of LPP" and "center of 14T" is smaller than 7T (260 ns) in any place around Linked area.
If the linking is done properly, mark OK in **Form 24T**.
- This test shall be done in the user area where the Drive can keep performing 16x-speed recording.

10.2.3 Information data in Lead-in and RMA

- The 16x/1x-speed DVD-R for General Standard Blank Test Disc recorded in the test of **10.2.1** shall be used for this check.
- Using DVD-R measuring system (Playback), check the recorded information data in Lead-in and RMA of the recorded Test Disc. The applicant shall fill out each column of **Form 25T**, and Class-A Lab will check them.

11. Test Specifications for 12cm/2x-speed DL Drive

This chapter covers the test specifications and tool requirements for the physical and logical compliance testing the 12cm/2x-speed DL Drive (2x-speed recordable) and the 2x-speed recording capability and the reading capability of 12cm/4x/2x-speed DL Drive (4x/2x-speed recordable), 12cm/6x/2x-speed DL Drive (6x/2x-speed recordable), 12cm/8x/2x-speed DL Drive (8x/2x-speed recordable), 12cm/10x/2x-speed DL Drive (10x/2x-speed recordable) and 12cm/12x/2x-speed DL Drive (12x/2x-speed recordable).

11.1 Test Tools

The following tools are required to perform the tests specified and shall be available before start executing the test procedures.

11.1.1 Test Discs

The following test discs are used for testing the 2x-speed recording capability of 12cm DL Drive. As for acquisition, refer to **Annex D**.

- 12cm/4x/2x-speed DVD-R for DL Standard Blank Test Disc
GRBTD-001-DL (Pioneer)
- 12cm DVD-R for DL Standard Signal Test Disc
GRSTD-101-DL (Pioneer)

11.1.2 DVD-R measuring system for DL (Playback)

DVD-R measuring system for DL (Playback) shall have functions at least for executing the tests defined in **11.2.1**, **11.2.2** and **11.2.3**. Its reading beam condition shall be as defined 2.1.3.2 of DVD Specifications for Recordable Disc for Dual layer Part 1: Ver.3.0 and its scanning velocity shall be 3.84 m/s (1x-speed).

This system is to be equipped by each Lab and applicant individually.

11.2 Test Specifications

The following sections describe the test procedures required for verification of 12cm DL Drive. The tests shall be performed according to the items described in **Form 26T to 29T**.

11.2.1 Recording characteristics

This test shall be done for 12cm/4x/2x-speed DVD-R for DL Standard Blank Test Disc.

Write Strategy specified in 2.2.3.8 of DVD Specifications for Recordable Disc for Dual layer Part 1: Ver.3.0 can be used for recording.

- Random or equivalent signal shall be written by 2x-speed in the user area of GRBTD-001-DL with the Drive. Both of Layer 0 and Layer 1 shall be recorded keeping the recording order (Refer to Annex GG).
- Measure the characteristics of the Recorded layer using DVD-R measuring system for DL (Playback) or equivalent and enter the measured values in accordance with **Form 26T**.

11.2.2 2x-speed Linking characteristic

- This test is only for 12cm/2x-speed DL Drive. Other types of product need not execute this test.
- Testing Layer is L0.
- Random or equivalent signal shall be written in the user area of L0 of a 12cm/4x/2x-speed DVD-R for DL Standard Blank Test Disc by the Drive. And append the random or equivalent signal in the Incremental recording mode according to the linking scheme that the drive adopts.
- Using DVD-R measuring system for DL (Playback), check whether the time difference between "the peak of LPP" and "center of 14T" is smaller than 7T (260 ns) in any place around Linked area.
If the linking is done properly, mark OK in **Form 27T**.

11.2.3 Information data in Lead-in and RMA

- 12cm/4x/2x-speed DVD-R for DL Standard Blank Test Discs recorded in the test of **11.2.1** shall be used for this check.
- Using DVD-R measuring system for DL (Playback), check the recorded information data in Lead-in and RMA of the recorded DVD-R for DL Standard Blank Test Disc. The applicant shall fill out each column of **Form 28T**, and Class-A Lab will check them.

11.2.4 Reading characteristics

- A 12cm DVD-R for DL Standard Signal Test Disc (GRSTD-101-DL) shall be read by the Drive. If the entire signal can be read properly, mark OK in **Form 29T**.

12. Test Specifications for 12cm/4x-speed recording capability of DL Drive

This chapter covers the test specifications and tool requirements for the physical and logical compliance testing the 4x-speed recording capability of 12cm/4x/2x-speed DL Drive (4x/2x-speed recordable), 12cm/6x/2x-speed DL Drive (6x/2x-speed recordable), 12cm/8x/2x-speed DL Drive (8x/2x-speed recordable), 12cm/10x/2x-speed DL Drive (10x/2x-speed recordable) and 12cm/12x/2x-speed DL Drive (12x/2x-speed recordable).

12.1 Test Tools

The following tools are required to perform the tests specified and shall be available before start executing the test procedures.

12.1.1 Test Disc

The following test disc is used for testing the 4x-speed recording capability of 12cm DL Drive. As for acquisition, refer to **Annex D**.

- 12cm/4x/2x-speed DVD-R for DL Standard Blank Test Disc
GRBTD-001-DL (Pioneer)

12.1.2 DVD-R measuring system for DL (Playback)

DVD-R measuring system for DL (Playback) shall have functions at least for executing the tests defined in **12.2.1**, **12.2.2** and **12.2.3**. Its reading beam condition shall be as defined 2.1.3.2 of DVD Specifications for Recordable Disc for Dual Layer Part 1: Ver. 3.0 and its scanning velocity shall be 3.84 m/s (1x-speed).

This system is to be equipped by each Lab and applicant individually.

12.2 Test Specifications

The following sections describe the test procedures of 4x-speed recording capability required for verification of DL Drive. The tests shall be performed according to the items described in **Form 30T to 32T**.

12.2.1 Recording characteristics

This test shall be done for 12cm/4x/2x-speed DVD-R for DL Standard Blank Test Disc.

Write Strategy specified in 2.1.5 of Optional Specifications 4x-speed DVD-R for DL Rev. 1.0 can be used for recording.

- Random or equivalent signal shall be written by 4x-speed in the user area of GRBTD-001-DL by the Drive. Both of Layer 0 and Layer 1 shall be recorded keeping the recording order (Refer to Annex GG).
- Recording speed at R=25, 40 and 55 can be carried out with the declared speed in **Form 2T**.
- Measure the characteristics of the Recorded layer using DVD-R measuring system for DL (Playback) or equivalent and enter the measured values in accordance with **Form 30T**.

12.2.2 4x-speed Linking characteristic

- This test is only for 12cm/4x/2x-speed DL Drive. Other types of product need not execute this test.
- 12cm/4x/2x-speed DVD-R for DL Standard Blank Test Discs can be used for this check.
- Testing Layer is L0.
- Random or equivalent signal shall be written in the user area of L0 of a 12cm/4x/2x-speed DVD-R for DL Standard Blank Test Disc by the Drive. And append the random or equivalent signal in the Incremental recording mode according to the linking scheme that the drive adopts.
- Using DVD-R measuring system for DL (Playback), check whether the time difference between "the peak of LPP" and "center of 14T" is smaller than 7T (260 ns) in any place around Linked area.

If the linking is done properly, mark OK in **Form 31T**.

12.2.3 Information data in Lead-in and RMA

- 12cm/4x-speed DVD-R for DL Standard Blank Test Discs recorded in the test of **12.2.1** shall be used for this check.
- Using DVD-R measuring system for DL (Playback), check the recorded information data in Lead-in and RMA of the recorded DVD-R for DL Standard Blank Test Disc. The applicant shall fill out each column of **Form 32T**, and Class-A Lab will check them.

13. Test Specifications for 12cm/6x-speed recording capability of DL Drive

This chapter covers the test specifications and tool requirements for the physical and logical compliance testing the 6x-speed recording capability of 12cm/6x/2x-speed DL Drive (6x/2x-speed recordable), 12cm/8x/2x-speed DL Drive (8x/2x-speed recordable), 12cm/10x/2x-speed DL Drive (10x/2x-speed recordable) and 12cm/12x/2x-speed DL Drive (12x/2x-speed recordable).

13.1 Test Tools

The following tools are required to perform the tests specified and shall be available before start executing the test procedures.

13.1.1 Test Disc

The following test disc is used for testing the 6x-speed recording capability of 12cm DL Drive. As for acquisition, refer to **Annex D**.

- 12cm/8x/2x-speed DVD-R for DL Standard Blank Test Disc
GRBTD-011-DL (Pioneer)

13.1.2 DVD-R measuring system for DL (Playback)

DVD-R measuring system for DL (Playback) shall have functions at least for executing the tests defined in **13.2.1**, **13.2.2** and **13.2.3**. Its reading beam condition shall be as defined 2.1.3.2 of DVD Specifications for Recordable Disc for Dual Layer Part 1: Ver. 3.0 and its scanning velocity shall be 3.84 m/s (1x-speed).

This system is to be equipped by each Lab and applicant individually.

13.2 Test Specifications

The following sections describe the test procedures of 6x-speed recording capability required for verification of DL Drive. The tests shall be performed according to the items described in **Form 33T to 35T**.

13.2.1 Recording characteristics

This test shall be done for 12cm/8x/2x-speed DVD-R for DL Standard Blank Test Disc.

Write Strategy specified in 2.1.5 of Optional Specifications 6x-speed DVD-R for DL Rev. 2.0 can be used for recording.

- Random or equivalent signal shall be written by 6x-speed in the user area of GRBTD-011-DL by the Drive. Both of Layer 0 and Layer 1 shall be recorded keeping the recording order (Refer to Annex GG).
- Recording speed at R=25, 40 and 55 can be carried out with the declared speed in **Form 2T**.
- Measure the characteristics of the Recorded layer using DVD-R measuring system for DL (Playback) or equivalent and enter the measured values in accordance with **Form 33T**.

13.2.2 6x-speed Linking characteristic

- This test is only for 12cm/6x/2x-speed DL Drive. Other types of product need not execute this test.
- 12cm/8x/2x-speed DVD-R for DL Standard Blank Test Discs can be used for this check.
- Testing Layer is L0.
- Random or equivalent signal shall be written in the user area of L0 of a 12cm/8x/2x-speed DVD-R for DL Standard Blank Test Disc by the Drive. And append the random or equivalent signal in the Incremental recording mode according to the linking scheme that the drive adopts.
- Using DVD-R measuring system for DL (Playback), check whether the time difference between "the peak of LPP" and "center of 14T" is smaller than 7T (260 ns) in any place around Linked area.

If the linking is done properly, mark OK in **Form 34T**.

13.2.3 Information data in Lead-in and RMA

- 12cm/8x/2x-speed DVD-R for DL Standard Blank Test Discs recorded in the test of **13.2.1** shall be used for this check.
- Using DVD-R measuring system for DL (Playback), check the recorded information data in Lead-in and RMA of the recorded DVD-R for DL Standard Blank Test Disc. The applicant shall fill out each column of **Form 35T**, and Class-A Lab will check them.

14. Test Specifications for 12cm/8x-speed recording capability of DL Drive

This chapter covers the test specifications and tool requirements for the physical and logical compliance testing the 8x-speed recording capability of 12cm/8x/2x-speed DL Drive (8x/2x-speed recordable), 12cm/10x/2x-speed DL Drive (10x/2x-speed recordable) and 12cm/12x/2x-speed DL Drive (12x/2x-speed recordable).

14.1 Test Tools

The following tools are required to perform the tests specified and shall be available before start executing the test procedures.

14.1.1 Test Disc

The following test disc is used for testing the 8x-speed recording capability of 12cm DL Drive. As for acquisition, refer to **Annex D**.

- 12cm/8x/2x-speed DVD-R for DL Standard Blank Test Disc
GRBTD-011-DL (Pioneer)

14.1.2 DVD-R measuring system for DL (Playback)

DVD-R measuring system for DL (Playback) shall have functions at least for executing the tests defined in **14.2.1**, **14.2.2** and **14.2.3**. Its reading beam condition shall be as defined 2.1.3.2 of DVD Specifications for Recordable Disc for Dual Layer Part 1: Ver. 3.0 and its scanning velocity shall be 3.84 m/s (1x-speed).

This system is to be equipped by each Lab and applicant individually.

14.2 Test Specifications

The following sections describe the test procedures of 8x-speed recording capability required for verification of DL Drive. The tests shall be performed according to the items described in **Form 36T to 38T**.

14.2.1 Recording characteristics

This test shall be done for 12cm/8x/2x-speed DVD-R for DL Standard Blank Test Disc.

Write Strategy specified in 2.1.5 of Optional Specifications 8x-speed DVD-R for DL Rev. 3.0 can be used for recording.

- Random or equivalent signal shall be written by 8x-speed in the user area of GRBTD-011-DL by the Drive. Both of Layer 0 and Layer 1 shall be recorded keeping the recording order (Refer to Annex GG).
- Recording speed at R=40 and 55 can be carried out with the declared speed in **Form 2T**.
- Measure the characteristics of the Recorded layer using DVD-R measuring system for DL (Playback) or equivalent and enter the measured values in accordance with **Form 36T**.

14.2.2 8x-speed Linking characteristic

- This test is only for 12cm/8x/2x-speed DL Drive. Other types of product need not execute this test.
- 12cm/8x/2x-speed DVD-R for DL Standard Blank Test Discs can be used for this check.
- Testing Layer is L0.
- Random or equivalent signal shall be written in the user area of L0 of a 12cm/8x/2x-speed DVD-R for DL Standard Blank Test Disc by the Drive. And append the random or equivalent signal in the Incremental recording mode according to the linking scheme that the drive adopts.
- Using DVD-R measuring system for DL (Playback), check whether the time difference between "the peak of LPP" and "center of 14T" is smaller than 7T (260 ns) in any place around Linked area.

If the linking is done properly, mark OK in **Form 37T**.

14.2.3 Information data in Lead-in and RMA

- 12cm/8x/2x-speed DVD-R for DL Standard Blank Test Discs recorded in the test of **14.2.1** shall be used for this check.
- Using DVD-R measuring system for DL (Playback), check the recorded information data in Lead-in and RMA of the recorded DVD-R for DL Standard Blank Test Disc. The applicant shall fill out each column of **Form 38T**, and Class-A Lab will check them.

15. Test Specifications for 12cm/10x-speed recording capability of DL Drive

This chapter covers the test specifications and tool requirements for the physical and logical compliance testing the 10x-speed recording capability of 12cm/10x/2x-speed DL Drive (10x/2x-speed recordable) and 12cm/12x/2x-speed DL Drive (12x/2x-speed recordable).

15.1 Test Tools

The following tools are required to perform the tests specified and shall be available before start executing the test procedures.

15.1.1 Test Disc

The following test disc is used for testing the 10x-speed recording capability of 12cm DL Drive. As for acquisition, refer to **Annex D**.

- 12cm/12x/2x-speed DVD-R for DL Standard Blank Test Disc
DHRR85TT1SP (Mitsubishi Kagaku Media)

15.1.2 DVD-R measuring system for DL (Playback)

DVD-R measuring system for DL (Playback) shall have functions at least for executing the tests defined in **15.2.1**, **15.2.2** and **15.2.3**. Its reading beam condition shall be as defined 2.1.3.2 of DVD Specifications for Recordable Disc for Dual Layer Part 1: Ver. 3.0 and its scanning velocity shall be 3.84 m/s (1x-speed).

This system is to be equipped by each Lab and applicant individually.

15.2 Test Specifications

The following sections describe the test procedures of 10x-speed recording capability required for verification of DL Drive. The tests shall be performed according to the items described in **Form 39T to 41T**.

15.2.1 Recording characteristics

This test shall be done for 12cm/12x/2x-speed DVD-R for DL Standard Blank Test Disc.

Write Strategy specified in 2.1.5 of Optional Specifications 10x-speed DVD-R for DL Rev. 4.0 can be used for recording.

- Random or equivalent signal shall be written by 10x-speed in the user area of DHRR85TT1SP by the Drive. Both of Layer 0 and Layer 1 shall be recorded keeping the recording order (Refer to Annex GG).
- Recording speed at R=40 and 55 can be carried out with the declared speed in **Form 2T**.
- Measure the characteristics of the Recorded layer using DVD-R measuring system for DL (Playback) or equivalent and enter the measured values in accordance with **Form 39T**.

15.2.2 10x-speed Linking characteristic

- This test is only for 12cm/10x/2x-speed DL Drive. Other types of product need not execute this test.
- 12cm/12x/2x-speed DVD-R for DL Standard Blank Test Discs can be used for this check.
- Testing Layer is L0.
- Random or equivalent signal shall be written in the user area of L0 of a 12cm/12x/2x-speed DVD-R for DL Standard Blank Test Disc by the Drive. And append the random or equivalent signal in the Incremental recording mode according to the linking scheme that the drive adopts.
- Using DVD-R measuring system for DL (Playback), check whether the time difference between "the peak of LPP" and "center of 14T" is smaller than 7T (260 ns) in any place around Linked area.

If the linking is done properly, mark OK in **Form 40T**.

15.2.3 Information data in Lead-in and RMA

- 12cm/12x/2x-speed DVD-R for DL Standard Blank Test Discs recorded in the test of **15.2.1** shall be used for this check.
- Using DVD-R measuring system for DL (Playback), check the recorded information data in Lead-in and RMA of the recorded DVD-R for DL Standard Blank Test Disc. The applicant shall fill out each column of **Form 41T**, and Class-A Lab will check them.

16. Test Specifications for 12cm/12x-speed recording capability of DL Drive

This chapter covers the test specifications and tool requirements for the physical and logical compliance testing the 12x-speed recording capability of 12cm/12x/2x-speed DL Drive (12x/2x-speed recordable).

16.1 Test Tools

The following tools are required to perform the tests specified and shall be available before start executing the test procedures.

16.1.1 Test Disc

The following test disc is used for testing the 12x-speed recording capability of 12cm DL Drive. As for acquisition, refer to **Annex D**.

- 12cm/12x/2x-speed DVD-R for DL Standard Blank Test Disc
DHRR85TT1SP (Mitsubishi Kagaku Media)

16.1.2 DVD-R measuring system for DL (Playback)

DVD-R measuring system for DL (Playback) shall have functions at least for executing the tests defined in **16.2.1**, **16.2.2** and **16.2.3**. Its reading beam condition shall be as defined 2.1.3.2 of DVD Specifications for Recordable Disc for Dual Layer Part 1: Ver. 3.0 and its scanning velocity shall be 3.84 m/s (1x-speed).

This system is to be equipped by each Lab and applicant individually.

16.2 Test Specifications

The following sections describe the test procedures of 12x-speed recording capability required for verification of DL Drive. The tests shall be performed according to the items described in **Form 42T to 44T**.

16.2.1 Recording characteristics

This test shall be done for 12cm/12x/2x-speed DVD-R for DL Standard Blank Test Disc.

Write Strategy specified in 2.1.5 of Optional Specifications 12x-speed DVD-R for DL Rev. 5.0 can be used for recording.

- Random or equivalent signal shall be written by 12x-speed in the user area of DHRR85TT1SP by the Drive. Both of Layer 0 and Layer 1 shall be recorded keeping the recording order (Refer to Annex GG).
- Measure the characteristics of the Recorded layer using DVD-R measuring system for DL (Playback) or equivalent and enter the measured values in accordance with **Form 42T**.

16.2.2 12x-speed Linking characteristic

- 12cm/12x/2x-speed DVD-R for DL Standard Blank Test Discs can be used for this check.
- Testing Layer is L0.
- Random or equivalent signal shall be written in the user area of L0 of a 12cm/12x/2x-speed DVD-R for DL Standard Blank Test Disc by the Drive. And append the random or equivalent signal in the Incremental recording mode according to the linking scheme that the drive adopts.
- Using DVD-R measuring system for DL (Playback), check whether the time difference between "the peak of LPP" and "center of 14T" is smaller than 7T (260 ns) in any place around Linked area.

If the linking is done properly, mark OK in **Form 43T**.

16.2.3 Information data in Lead-in and RMA

- 12cm/12x/2x-speed DVD-R for DL Standard Blank Test Discs recorded in the test of **16.2.1** shall be used for this check.
- Using DVD-R measuring system for DL (Playback), check the recorded information data in Lead-in and RMA of the recorded DVD-R for DL Standard Blank Test Disc. The applicant shall fill out each column of **Form 44T**, and Class-A Lab will check them.

17. Test Specifications for 8cm/2x-speed recording capability of DL Drive

This chapter covers the test specifications and tool requirements for the physical and logical compliance testing the 2x-speed recording capability of 8cm/2x-speed DL Drive (2x-speed recordable) and 8cm/4x/2x-speed DL Drive (4x/2x-speed recordable).

17.1 Test Tools

The following tools are required to perform the tests specified and shall be available before start executing the test procedures.

17.1.1 Test Disc

The following test disc is used for testing the 2x-speed recording capability of 8cm DL Drive. As for acquisition, refer to **Annex D**.

- 8cm/4x/2x-speed DVD-R for DL Standard Blank Test Disc
GRBTD8-001-DL (Pioneer)
- 8cm DVD-R for DL Standard Signal Test Disc
GRSTD8-101-DL (Pioneer)

17.1.2 DVD-R measuring system for DL (Playback)

DVD-R measuring system for DL (Playback) shall have functions at least for executing the tests defined in **17.2.1**, **17.2.2** and **17.2.3**. Its reading beam condition shall be as defined 2.1.3.2 of DVD Specifications for Recordable Disc for Dual Layer Part 1: Ver. 3.0 and its scanning velocity shall be 3.84 m/s (1x-speed).

This system is to be equipped by each Lab and applicant individually.

17.2 Test Specifications

The following sections describe the test procedures of 8cm/2x-speed recording capability required for verification of DL Drive. The tests shall be performed according to the items described in **Form 45T to 48T**.

17.2.1 Recording characteristics

This test shall be done for 8cm/4x/2x-speed DVD-R for DL Standard Blank Test Disc.

Write Strategy specified in 2.2.3.8 of DVD Specifications for Recordable Disc for Dual layer Part 1: Ver.3.0 can be used for recording.

- Random or equivalent signal shall be written by 2x-speed in the user area of GRBTD8-001-DL with the Drive. Both of Layer 0 and Layer 1 shall be recorded keeping the recording order (Refer to Annex GG).
- Measure the characteristics of the Recorded layer using DVD-R measuring system for DL (Playback) or equivalent and enter the measured values in accordance with **Form 45T**.

17.2.2 2x-speed Linking characteristic

- This test is only for 8cm/2x-speed DL Drive. Other types of product need not execute this test.
- 8cm/4x/2x-speed DVD-R for DL Standard Blank Test Discs can be used for this check.
- Testing Layer is L0.
- Random or equivalent signal shall be written in the user area of L0 of an 8cm/4x/2x-speed DVD-R for DL Standard Blank Test Disc by the Drive. And append the random or equivalent signal in the Incremental recording mode according to the linking scheme that the drive adopts.
- Using DVD-R measuring system for DL (Playback), check whether the time difference between "the peak of LPP" and "center of 14T" is smaller than 7T (260 ns) in any place around Linked area.

If the linking is done properly, mark OK in **Form 46T**.

17.2.3 Information data in Lead-in and RMA

- 8cm/4x/2x-speed DVD-R for DL Standard Blank Test Discs recorded in the test of **17.2.1** shall be used for this check.
- Using DVD-R measuring system for DL (Playback), check the recorded information data in Lead-in and RMA of the recorded DVD-R for DL Standard Blank Test Disc. The applicant shall fill out each column of **Form 47T**, and Class-A Lab will check them.

17.2.4 Reading characteristics

- An 8cm DVD-R for DL Standard Signal Test Disc (GRSTD8-101-DL) shall be read by the Drive. If the entire signal can be read properly, mark OK in **Form 48T**.

18. Test Specifications for 8cm/4x-speed recording capability of DL Drive

This chapter covers the test specifications and tool requirements for the physical and logical compliance testing the 8cm/4x/2x-speed DL Drive (4x/2x-speed recordable).

18.1 Test Tools

The following tools are required to perform the tests specified and shall be available before start executing the test procedures.

18.1.1 Test Disc

The following test disc is used for testing the 4x-speed recording capability of 8cm DL Drive. As for acquisition, refer to **Annex D**.

- 8cm/4x/2x-speed DVD-R for DL Standard Blank Test Disc
GRBTD8-001-DL (Pioneer)

18.1.2 DVD-R measuring system for DL (Playback)

DVD-R measuring system for DL (Playback) shall have functions at least for executing the tests defined in **18.2.1**, **18.2.2** and **18.2.3**. Its reading beam condition shall be as defined 2.1.3.2 of DVD Specifications for Recordable Disc for Dual Layer Part 1: Ver. 3.0 and its scanning velocity shall be 3.84 m/s (1x-speed).

This system is to be equipped by each Lab and applicant individually.

18.2 Test Specifications

The following sections describe the test procedures of 8cm/4x-speed recording capability required for verification of DL Drive. The tests shall be performed according to the items described in **Form 49T** to **51T**.

18.2.1 Recording characteristics

This test shall be done for 8cm/4x/2x-speed DVD-R for DL Standard Blank Test Disc.

Write Strategy specified in 2.1.5 of Optional Specifications 4x-speed DVD-R for DL Rev. 1.0 can be used for recording.

- Random or equivalent signal shall be written by 4x-speed in the user area of GRBTD8-001-DL by the Drive. Both of Layer 0 and Layer 1 shall be recorded keeping the recording order (Refer to Annex GG).
- Recording speed at R=25 can be carried out with the declared speed in **Form 2T**.
- Measure the characteristics of the Recorded layer using DVD-R measuring system for DL (Playback) or equivalent and enter the measured values in accordance with **Form 49T**.

18.2.2 4x-speed Linking characteristic

- 8cm/4x/2x-speed DVD-R for DL Standard Blank Test Discs can be used for this check.
- Testing Layer is L0.
- Random or equivalent signal shall be written in the user area of L0 of an 8cm/4x/2x-speed DVD-R for DL Standard Blank Test Disc by the Drive. And append the random or equivalent signal in the Incremental recording mode according to the linking scheme that the drive adopts.
- Using DVD-R measuring system for DL (Playback), check whether the time difference between "the peak of LPP" and "center of 14T" is smaller than 7T (260 ns) in any place around Linked area.

If the linking is done properly, mark OK in **Form 50T**.

18.2.3 Information data in Lead-in and RMA

- 8cm/4x/2x-speed DVD-R for DL Standard Blank Test Discs recorded in the test of **18.2.1** shall be used for this check.
- Using DVD-R measuring system for DL (Playback), check the recorded information data in Lead-in and RMA of the recorded DVD-R for DL Standard Blank Test Disc. The applicant shall fill out each column of **Form 51T**, and Class-A Lab will check them.

Annex A

List of Class-A Verification Labs

This List is correct at the time of publication. However, when the Class-A Lab information contained here differs from such information cited in our website www.dvdfllc.co.jp, the List with more current date prevails. Also, please refer to the website for the latest Verification Service of each Class-A Lab.

Hitachi Consumer Electronics Co., Ltd.

Format Verification Center

292 Yoshida-cho, Totsuka-ku, Yokohama-shi, Kanagawa, 244-0817 Japan

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Format Verification Laboratory

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PIONEER CORPORATION

Verification Laboratory

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Annex B

Glossary of Terms used

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Annex C

Procedure for Class-A Verification Lab Product Submission

The procedure for submitting a product to a Class-A Verification Lab is as follows:

Preliminary Application

Applicant must complete **Form 1T** to provide preliminary information.

Self Test

Applicant must test the product in accordance with this Test Specification prior to submitting samples to a Class-A Verification Lab. Applicant must complete **Form 2T**, and **necessary Forms*** to provide test results.

*Note: **Necessary Forms for each Product type** are as follows;

- 12cm/1x-speed DVD-R Drive for General : **Form 3T to 6T**
- 8cm/1x-speed DVD-R Drive for General : **Form 7T to 10T**
- 12cm/4x/1x-speed DVD-R Drive for General : **Form 3T, 5T, 6T, and 11T to 13T**
- 12cm/6x/1x-speed DVD-R Drive for General : **Form 3T, 5T, 6T, 11T, 13T, and 14T to 16T**
- 12cm/8x/1x-speed DVD-R Drive for General : **Form 3T, 5T, 6T, 11T, 13T, and 17T to 19T**
- 12cm/12x/1x-speed DVD-R Drive for General : **Form 3T, 5T, 6T, 11T, 13T, 17T, 19T to 22T**
- 12cm/16x/1x-speed DVD-R Drive for General : **Form 3T, 5T, 6T, 11T, 13T, 17T, 19T and 23T to 25T**
- 12cm/2x-speed DVD-R Drive for DL : **Form 26T to 29T**
- 12cm/4x/2x-speed DVD-R Drive for DL : **Form 26T to 32T**
- 12cm/6x/2x-speed DVD-R Drive for DL : **Form 26T to 35T**
- 12cm/8x/2x-speed DVD-R Drive for DL : **Form 26T to 38T**
- 12cm/10x/2x-speed DVD-R Drive for DL : **Form 26T to 41T**
- 12cm/12x/2x-speed DVD-R Drive for DL : **Form 26T to 44T**
- 8cm/2x-speed DVD-R Drive for DL : **Form 45T to 48T**
- 8cm/4x/2x-speed DVD-R Drive for DL : **Form 45T to 51T**

Mutual Non-Disclosure Agreement (NDA)

Applicant, in order to maintain the confidentiality of the applicant's product and Verification Lab's information, must sign a Mutual Non-Disclosure Agreement.

Application

Applicant must submit 3 product samples along with **Form 2T**, said **necessary Forms** and the NDA.

Test Results

Upon completion of testing, Verification Lab will complete **Form 52T** to inform the applicant and DVD Format Logo/Licensing Corporation of the test results.

Annex D

Test Tool Contact Information

The Contact Information is correct at the time of publication. However, when the Class-A Lab information (marked <*>) differs from such information cited in our website www.dvdfllc.co.jp, the List with more current date prevails.

For 12cm Drive

<ul style="list-style-type: none"> 12cm DVD-R for General Standard Signal Test Disc Type 1; GRSTD-101 	PIONEER CORPORATION<*> Verification Laboratory 1-1 Shin-ogura, Saiwai-ku, Kawasaki-shi, Kanagawa, 212-0031 Japan Fax: +81-44-580-4027
<ul style="list-style-type: none"> 12cm/1x-speed DVD-R for General Standard Blank Test Disc Type 1; GRBTD-001 	
<ul style="list-style-type: none"> 12cm/4x/1x-speed DVD-R Standard Blank Test Disc GRBTD-021 	
<ul style="list-style-type: none"> 12cm/8x/1x-speed DVD-R Standard Blank Test Disc GRBTD-031 	
<ul style="list-style-type: none"> 12cm/16x/1x-speed DVD-R Standard Blank Test Disc GRBTD-041 	
<ul style="list-style-type: none"> 12cm/4x/2x-speed DVD-R for DL Standard Blank Test Disc GRBTD-001-DL 	
<ul style="list-style-type: none"> 12cm/8x/2x-speed DVD-R for DL Standard Blank Test Disc GRBTD-011-DL 	
<ul style="list-style-type: none"> 12cm DVD-R for DL Standard Signal Test Disc GRSTD-101-DL 	MITSUBISHI KAGAKU MEDIA Co., Ltd. Global Sales Support Dept. 31-19, Shiba 5-chome, Minato-ku, Tokyo 108-8415 Japan Fax: +81-3-5484-3906
<ul style="list-style-type: none"> 12cm/12x/2x-speed DVD-R for DL Standard Blank Test Disc DHRR85TT1SP 	

For 8cm Drive

<ul style="list-style-type: none"> 8cm/1x-speed DVD-R for General Standard Blank Test Disc Type 1; R-HM110 	Hitachi Maxell, Ltd. 6139-1, Ohnogo, mitsukaido-shi, Ibaraki, 300-2595 Japan Fax: +81-297-24-5269
<ul style="list-style-type: none"> 8cm DVD-R for General Standard Signal Test Disc Type 1; R-HM110-A 	
<ul style="list-style-type: none"> 8cm/4x/2x-speed DVD-R for DL Standard Blank Test Disc GRBTD8-001-DL 	PIONEER CORPORATION<*> Verification Laboratory 1-1 Shin-ogura, Saiwai-ku, Kawasaki-shi, Kanagawa, 212-0031 Japan Fax: +81-44-580-4027
<ul style="list-style-type: none"> 8cm DVD-R for DL Standard Signal Test Disc GRSTD8-101-DL 	